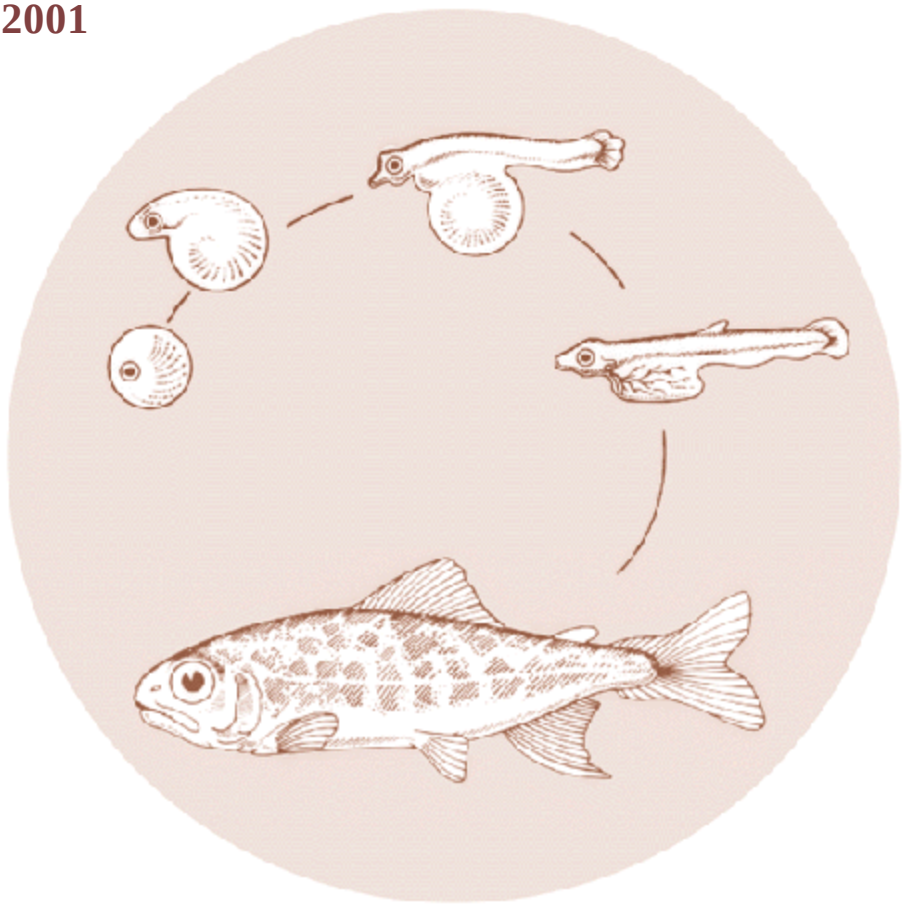
Grande Ronde Basin Supplementation Program

Lostine River

Annual Report
2001



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ANNUAL ESA REPORT

Project Title: Grande Ronde Supplementation Program: the Lostine River Component

Permit Holder: Mr. Robert C. Lothrop
Columbia River Inter-Tribal Fish Commission

Permit Number: Endangered Species Permit No. 1149

Permit Contact: Becky Ashe/ Jim Harbeck

Permit Period: January 1, 2001 through December 31, 2001

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Introduction

Permitted Program

The Northwest Power Planning Council (NPPC) identified supplementation as a high priority to achieve its goal of increasing runs of anadromous fish in the Columbia Basin. Supplementation activities in the Lostine River and associated monitoring and evaluation conducted by the Nez Perce Tribe relate directly to the needs addressed in the Columbia River Basin Fish and Wildlife Program (NPPC 1994). Measure 7.4L.1 of the Program mandates that appropriate research accompany any proposed supplementation. In addition, measure 7.3B.2 of the Program stresses the need for evaluating supplementation projects to assess their ability to increase production. Finally, Section 7.4D.3 encourages the study of hatchery rearing and release strategies to improve survival and adaptation of cultured fish.

In 1997, Oregon Department of Fisheries and Wildlife (ODFW) requested a modification of Permit 1011 to allow the take of adult spring chinook salmon. In 1998, the Nez Perce Tribe also requested a permit specific to activities on Lostine River. The permit was issued in 2000. A special condition in the permits required the development of a long term management plan for the spring chinook salmon of the Grande Ronde Basin. The Nez Perce Tribe, ODFW, and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) completed a formal long range plan entitled "Grande Ronde Basin Endemic Spring Chinook Salmon Supplementation Program". The program proposes to increase the survival of spring chinook salmon in the Grand Ronde Basin through hatchery intervention. Adult salmon from the Lostine River, Catherine Creek, and the Upper Grande Ronde River are used for a conventional supplementation program in the basin. The Nez Perce program currently operates under the ESA Section 10 Permit 1149.

Activities Conducted

The Nez Perce Tribe and ODFW are responsible for supplementation activities and monitoring and evaluation on the Lostine River. ODFW's Fish Pathology Laboratory in La Grande, Oregon, provides fish health and disease monitoring. A weir and trap are operated on the Lostine River for the collection of chinook broodstock and the collection of biological data. Daily monitoring of the weir coincides with its operation along with the collection of environmental data. The Nez Perce Tribe also operates the Lostine River Acclimation Facility and monitors juvenile in-hatchery performance and emigration. Therefore, the performance of adult and juvenile hatchery fish is evaluated against the standards set by natural production. The Nez Perce Tribe also conducts spawning ground surveys with co-managers.

Weir Monitoring and Operation

WEIR MONITORING

Monitoring of the Lostine River weir and traps is coordinated between NPT research and production personnel. Information gathered includes both environmental and biological data. This data contributes to the assessment of weir impacts on fish passage. In addition, acquiring baseline information on the remnant stock of spring chinook salmon allows for the effective evaluation of supplementation. Monitoring of the weir coincides with its operation. Therefore, data collection associated with the weir occurred from April 18 to October 1 in 2001. *Figure 1* compares the 2001 adult weir catch and run timing with that predicted for the Lostine River in 2001. Fishing at the weir and trap was interrupted on one occasion due to high flows. These interruptions occurred during times of likely salmon migration.

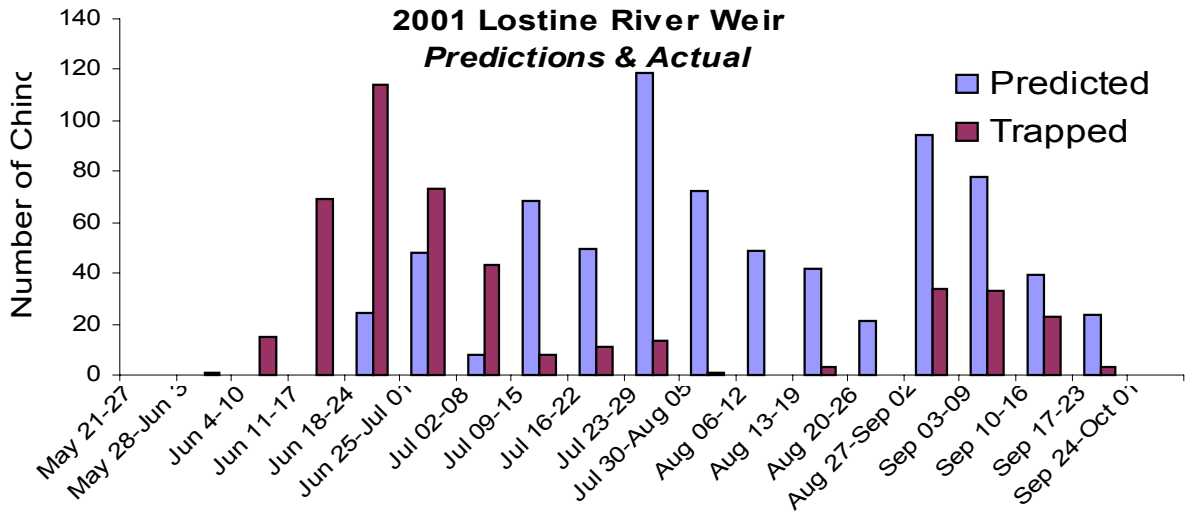

Figure 1. Number of predicted and actual chinook salmon returning to the Lostine River weir in 2001 according to week.

Biological Data

Data were obtained from fish interrogated at the weir and during bank surveys above and below the weir**.** The weir trap is checked for fish each morning. All non-target fish are examined without anesthesia and passed above the weir. Chinook salmon are dip-netted using a net of knotless material and placed in an anesthetic tank. Captured chinook are anesthetized with a solution of tricaine methane sulfonate (MS-222).

Biological data are recorded for each salmon trapped at the Lostine River weir. This data allows comparisons of life history traits of the salmon population prior to supplementation and during the supplementation process. Age is delineated through length frequency analysis. Preliminary characteristics of the 2001 adult spring chinook population are summarized below (*Table 1*).

Table 1. Summary characteristics of Lostine River spring chinook salmon sampled at the weir, 2001.

Trait	Population Characteristic
Sex Ratio	267M / 177F (1.5:1)
Age Composition (number/percent)	age-3: 36 / 8% age-4: 381 / 86% age-5: 25 / 6%
Age Composition (according to sex)	Male: age-3 36; age-4 209; age-5 19 Female: age-4 172; age-5 6
Mean Length-at-Age (total sample)	age-3: $\tilde{}$ = 526 mm min: 413 mm max: 620 mm age-4: $\tilde{}$ = 766 mm min: 644 mm max: 848 mm age-5: $\tilde{}$ = 906 mm min: 850 mm max: 990 mm
Mean Length-at-Age (according to sex)	Male: age-3: $\tilde{}$ = 526 mm; age-4: $\tilde{}$ = 760 mm; age-5: $\tilde{}$ = 910 mm Female: age-4: $\tilde{}$ = 772 mm; age-5: $\tilde{}$ = 894 mm
Origin	340 natural: no identifying fin clips or tags. 100 AD clips: likely Lostine origin and 4 AD/RV; likely Rapid River Origin
Migration Timing	See Figure 1

Incidental Catch

In addition to the 444 chinook salmon trapped and sampled at the weir, bull trout, *Salvelinus confluentus,* steelhead trout, *Oncorhynchus mykiss,* mountain whitefish, *Prosopium williamsoni,* and largescale suckers, *Catostomus macrocheilus* were also trapped and released upstream of the weir. Steelhead kelts were released downstream of the weir. Preliminary characteristics of captured bull trout steelhead, whitefish and largescale suckers are summarized below (*Table 2*).

Table 2. Summary of Lostine weir incidental catch, 2001.

Species	*n*	Mean length (mm)	Sex Ratio (M:F)	Migration Dates
bull trout	97	500	undetermined	4/27 – 7/4
steelhead	75	634	1:1	4/26 – 6/5
whitefish	282	349	undetermined	4/29 – 7/9
sucker	173	undetermined	undetermined	4/27 - 7/21

Environmental Data

Water temperature and river flow are monitored to correlate migration timing with the physical conditions of the river. Water temperatures are also checked at the weir site 3 times daily to ensure that temperatures are within limits for safe fish handling. Within the time frame of weir operations temperatures ranged from a low of 35° Fahrenheight to a high of 69° Fahrenheight.

NPT personnel also read an onsite staff gauge located at the weir. Water levels recorded from the staff gauge ranged from a height of 2.7 ft. to below the bottom of the gage (unreadable). Flows from the Lostine River at the Baker Rd. bridge are also available online from the USGS WEB site and are downloaded to complement the staff gauge data. Stream discharge according to the

USGS monitoring station ranged from a high of 1080 cfs to a low of 13 cfs during weir operations.

Weir Effect Monitoring

Although the weir is designed to guide immigrating fish to the traps, there is concern that it may negatively affect fish migrations. During weir operation, daily bank surveys are conducted to detect any negative impact on fish movement. Surveys on the Lostine River are conducted above and below the weir simultaneously. Over 610 fish observations were recorded during 106 bank surveys above and below the weir (*Table 3*). The majority of these observations were spawning largescale suckers. During June large numbers of post-spawn suckers congregated above the weir. It was apparent that these fish were hindered from further downstream movement by the weir and lack of downstream trap. Therefore, weir panels were temporarily lowered and the fish were allowed to pass downstream of the weir.

There were 169 observations of chinook salmon below the weir. The majority of these observations can be attributed to the several redds and spawning adults which were noted in areas of suitable spawning substrates. Fifty one salmonids other than chinook were observed below the weir while nine other salmonids were noted above. These results may be skewed in that sampling effort was higher downstream of the weir. Habitat below the weir is also of better quality than that immediately above the weir. Hence, fish would naturally be more abundant below the weir. Innumerable larval and juvenile fish were also noted on both sides of the weir.

The lower sections of the Lostine River provide 14 irrigation ditches with water resources. There is concern that the dewatering may impact salmon due to physical and/or thermal barriers to migration. NPT personnel snorkeled the Lostine River below the weir on July 18 to estimate the number of salmon holding in the lower river. An estimated 12 chinook adults were viewed holding in lower river pools. The river below the weir was snorkeled again on August 10 and an estimated 36 adults were observed. Based on this information, a voluntary closure of most of the irrigation ditches was negotiated in an effort to raise river levels and pass the holding salmon upstream. Irrigators closed their ditches from Aug 17 to Aug. 18. Flows increased from 14 cfs to 104 cfs during the flushing event. Flows receded by the end of the 18th. Three chinook salmon entered the weir trap during the flush. Subsequent snorkeling on Aug. 20 found 60 chinook salmon holding below the weir.

Although several chinook spawned below the weir this is likely due to better habitat conditions rather than the weir blocking migrations. Spawning substrate is uncommon for at least 5 miles above the weir whereas redds have traditionally been found below the weir in suitable substrates (Thompson and Haas 1960). The lack of any other fish aggregations immediately below the weir suggests no adverse affect on upstream movements.

Table 3. Chinook salmon observations during foot and snorkel surveys below and above the weir in 2001.

Survey Type	Date Range		# of Surveys	Live Chinook Observed	Carcasses Observed
Foot (bank)	27-April	1-Oct	106	166 below / 3 above	2
Snorkel	18-July	20-Aug	3	108 below	0

WEIR OPERATIONS

Because of the inability of the original aluminum picket weir to function effectively at high flows and our desire to fish across the entire chinook run, a new alternative steel panel weir was tried in 2000. The panel weir was used for the entire 2001 season. The panel type weir is described by Schroeder (1996) and Clay (1995). The weir is composed of two transitional panels, one oversized panel for low water trap installation and thirteen 4 ft panels. A winch system allows the weir to be raised and lowered according to flow conditions and need. The pickets or mesh are supported by the preconstructed panel frames. The pickets are spaced with a one inch gap to allow juvenile fish passage. The top of the panels are angled downstream to help diffuse head differential and transfer the force of water onto the supporting cable (Schroeder 1996).

The panel style weir was installed and fishing at the Willet site by April 18. Fishing was interrupted for a few hours during the week of May 20 due to debris load. Fishing resumed after May 25 and continued uninterrupted through October 1. The site was manned 24 hours a day throughout the tapping season when the weir was closed and fishing.

Adult Collections

Four hundred and forty four adult chinook salmon were collected, sampled and processed at the weir. One chinook mortality occurred at the trap site in 2001. Fish were processed the day of their capture and either passed upstream or retained for broodstock (*Appendix 4*). All fish trapped were given an opercle mark (punch). Fish retained for broodstock were given 3 right opercle punches as a secondary mark to indicate tributary of origin and an opercle tag with a code to identify individual fish. Fish passed upstream were given a unique opercle punch indicating their week of capture. The mark was also used for the mark-and-recapture population estimates (carcass recoveries during spawning ground surveys).

Injuries

The trapped chinook generally appeared to be in good condition. Only 5% of the collected fish displayed any type of injury or physical abnormality (*Appendix A*). Most of the injuries appeared to have occurred prior to entry into the trap. Evidence of gas supersaturation (headburn) was apparent on 3 of the fish collected. After the September 1 the majority of the fish trapped were in a ripened condition.

Steps Taken to Minimize Trap-related Problems and Disturbance

NMFS criteria for weir and trap facilities were followed in the development of the Lostine panel weir. The weir spans approximately 60 meters across the river channel at a 45 ° angle with 16 panels spanning the river. The trap is designed with picket wings to guide fish into the trap and with a V-shaped fyke opening to inhibit escape.

The holding cage is placed in an area deep enough to maintain fish during minimum flows and where flow is sufficient to attract fish. Shade material covers the top of the trap and a solid panel on the upstream side of the trap provides an eddy for captured fish. Metal edges inside the trap are covered by foam pipe insulators. Processing of trapped fish occurs quickly to minimize their time out of water and their time under anesthetic. Activities that can be accomplished with the fish partially submerged are completed in that fashion.

Transportation

The Nez Perce Tribe provided transportation for 78 adult chinook retained for broodstock from the weir to Lookingglass Fish Hatchery. All fish were transported on the day of their capture. No mortalities occurred during transportation in 2001. The fish were transferred from the trap to the transport vehicle via a soft-mesh dipnet. The hauling water was treated with PolyAqua®, a water conditioner formulated to reduce disease outbreak and stress. Temperatures of the hauling water were also monitored and a NPT fish transport document was signed by the receiving facility manager for each transportation. Once at Lookingglass Fish Hatchery, the fish were transferred from the transport truck to the holding tank using a dipnet.

Derivation of Take Estimates

All estimates of take were made by direct count of fish at the trapping facility, during frequent surveys for a one-mile reach below the weir, or during six spawning ground surveys both above and below the weir.

Maturity and Spawning

BROODSTOCK COLLECTION

As per the Annual Operating Plan (AOP), no more than 1 in 5 (20%) of the non-captive origin chinook salmon returning to the Lostine River weir were retained for broodstock. Of the 444 chinook trapped at the weir, 78 were retained for broodstock. Fish were selected for broodstock systematically according to sex and age (jack or 4/5 year old).

Fish selected for brood were injected with antibiotics at the weir site. Each fish was given a intraperitoneal injection of erythromycin 200 (20mg/kg) and a intraperitoneal injection of oxytetracycline 200 (10 mg/kg). Injection volume for each antibiotic was according to fish specific length. The required prescriptions for the antibiotic treatments were obtained from a consulting veterinarian via ODFW Fish Pathology staff. Ripe fish were not injected.

Pre-spawning mortality

Two Lostine chinook died at the weir and trap. No brood fish died enroute to the hatchery. Twelve chinook brood died in the holding pond while at Lookingglass Fish Hatchery prior to spawning.

GAMETE COLLECTION

Spawning of the Lostine brood fish occurred August 16, 23, 30, September 5, 11 and 18 with NPT staff assisting ODFW crews. Spawning matrices were developed for 1 natural jack, 30 natural males, 26 natural females, 3 hatchery males and 10 hatchery females. From the 36 females spawned, 156,260 eggs were taken to Oxbow Hatchery for incubation. Egg loss amounted to 27.05% (42,267) of the take. An estimated 87,205 smolts will result from this spawn.

The Nez Perce Tribe also cryopreserved sperm from Lostine River fish collected under CRITFC Permit 1134 (*Table 4).* Samples from each male are being stored at the University of Idaho and Washington State University.

Table 4. Collection of fish and disposition of semen collected from male spring chinook salmon from the Lostine River in 2001 (covered under associated CRITFC Permit 1134).

Collection Date	Collection Site	Males Collected	Hatchery ID	Sperm Sample #	Sample Disposition	Archive Location
08-30-01	LGH	1	None	NPT-961-01	Cryopreserved	WSU/U of Id.
08/30-01	LGH	1	None	NPT-962-01	Cryopreserved	WSU/U of Id.
08/30/01	LGH	1	L18	NPT-963-01	Cryopreserved	WSU
08/30/01	LGH	1	L39	NPT-964-01	Cryopreserved	WSU/U of Id.
08/30/01	LGH	1	L23	NPT-965-01	Cryopreserved	U of Id.
08/30/01	LGH	1	L9	NPT-966-01	Cryopreserved	WSU/U of Id.
08/30/01	LGH	1	L53	NPT-967-01	Cryopreserved	WSU/U of Id.
08/30/01	LGH	1	L58	NPT-968-01	Cryopreserved	WSU/U of Id.
08/30/01	LGH	1	L15	NPT-969-01	Cryopreserved	WSU
08/30/01	LGH	1	L28	NPT-970-01	Cryopreserved	WSU

Collection Date	Site	Males Collected	Hatchery ID	Sperm Sample #	Sample Disposition	Archive Location
08/30/01	LGH	1	L36	NPT-971-01	Cryopreserved	U of Id.
08/30/01	LGH	1	L44	NPT-972-01	Cryopreserved	WSU/U of Id.
08/30/01	LGH	1	L56	NPT-973-01	Cryopreserved	?/U of Id.
09/05/01	LGH	1	L68	NPT-980-01	Cryopreserved	WSU/U of Id.
09/05/01	LGH	1	L30	NPT-981-01	Cryopreserved	WSU/U of Id.
09/05/01	LGH	1	L63	NPT-982-01	Cryopreserved	WSU/U of Id.
09/05/01	LGH	1	L4	NPT-983-01	Cryopreserved	WSU/U of Id.
09/05/01	LGH	1	L16	NPT-984-01	Cryopreserved	WSU/U of Id.
09/05/01	LGH	1	L39	NPT-985-01	Cryopreserved	WSU/U of Id.
09/11/01	LGH	1	L6	NPT-974-01	Cryopreserved	U of Id.
09/11/01	LGH	1	L65	NPT-975-01	Cryopreserved	U of Id.
09/11/01	LGH	1	L31	NPT-976-01	Cryopreserved	U of Id.
09/11/01	LGH	1	L67	NPT-977-01	Cryopreserved	WSU
09/11/01	LGH	1	L9	NPT-978-01	Cryopreserved	WSU
09/11/01	LGH	1	L46	NPT-979-01	Cryopreserved	WSU
09/11/01	LGH	1	L11	NPT-986-01	Cryopreserved	WSU
09/11/01	LGH	1	L55	NPT-987-01	Cryopreserved	WSU
09/11/01	LGH	1	L60	NPT-988-01	Cryopreserved	WSU
09/11/01	LGH	1	L56	NPT-989-01	Cryopreserved	WSU
09/11/01	LGH	1	L26	NPT-990-01	Cryopreserved	WSU
09/11/01	LGH	1	L77	NPT-991-01	Cryopreserved	WSU
09/11/01	LGH	1	L50	NPT-992-01	Cryopreserved	WSU
09/11/01	LGH	1	L40	NPT-993-01	Cryopreserved	WSU

Adult Health Monitoring and Disease

All *Renibacterium salmoninarum* (Rs) antigen values from 35 Lostine River female spawners were ≤ 0.123 OD units. Therefore, all eggs from these were categorized as BKD lows for production. One of 30 (3.3%) males had a moderate ELISA value of 0.597 OD units. Infectious hematopoietic necrosis virus (IHNV) was isolated from 1/36 (2.8%) females and confirmed to be a Type 2 isolate. This was a first-time isolation of IHNV from this stock.

There were 12 Lostine River adult mortalities at Lookingglass Hatchery; none of these were due to BKD (Table 8). One fall back mortality at the Lostine River was found to have a moderate level of *Aeromonas salmonicida* (furunculosis).

Prescriptions were obtained for injections of oxytetracycline and erythromycin for the control of furunculosis and BKD from a consulting veterinarian via ODFW Fish Pathology staff. Fish selected for brood were injected with antibiotics at the weir site. Each fish transported to Lookingglass Hatchery was given an intraperitoneal injection of erythromycin (20 mg/kg) and oxytetracycline (10 mg/kg). Ripe fish at the traps were not injected. Fish held at Lookingglass Hatchery for spawning were re-inoculated the first week in August. Dead egg masses were noted on 22/27 (81.5%) of females that were injected with erythromycin. This was attributed to the intraperitoneal injection route for erythromycin that was changed in 2001 from the dorsal sinus route used in previous years. Fish that were not collected for broodstock were released above the weir without antibiotic injection. In addition, a prescription was obtained for the use of formalin for fungus control. However, due to a review process for effluent dilution requirements by the Oregon Department of Environmental Quality (DEQ) the use of formalin was restricted and hydrogen peroxide was used as an interim fungus control measure.

Table 5. Summary of necropsy findings for Lostine River conventional broodstock spring chinook mortalities from Lookingglass Fish Hatchery (unless otherwise noted), 2001.

Stock/ Mortality date		Sex	ELISA OD	Significant clinical findings	Comments
Lostine River					
	30 JUN	M	0.086	Aeromonad-pseudomonad (APS) low level	
	4 JUL	M	0.073	No systemic bacteria - injury related	Weir
	9 JUL		0.078	*Aeromonas salmonicida* - moderate level	Fall back
	13 JUL	F	0.076	Mixed bacteria - low level, Fungus head	
	5 AUG	F	0.084	APS bacteria, head fungus & snout erosion	
	15 AUG	F	0.074	APS bacteria, head fungus	
	18 AUG	M	0.076	APS bacteria, severe caudal erosion	
	22 AUG	F	0.073	APS bacteria	Spawned
	26 AUG	F	0.075	Egg mass near injection site	Spawned
	29 AUG	F	0.094	Some head fungus	
	18 SEP	M	0.101	Fungus patches ~45% of body	
	18 SEP	M	0.089	Fungus patches ~45% of body	
	25 SEP	M	0.084	Patchy abrasions	
	25 SEP	M	0.115	APS bacteria, Extensive body fungus	

Spawning Ground Surveys

NPT personnel attended survey methodology training in McCall, ID prior to chinook spawning ground surveys. The Nez Perce Tribe conducted Lostine River surveys in coordination with ODFW and the US Forest Service. The surveys are intended to bracket spawning time, provide an index for population estimates, and acquire biological data from recovered carcasses.

2001 RESULTS

Scheduled surveys occurred on August 24, 31 and September 7. A number of mature chinook salmon in pre-spawning condition as well as several new redds were noted below the weir after the last scheduled survey. In response NPT personnel conducted additional surveys below the weir on September 14, 14, and 28. We have no substantial evidence that the presence or operation of the Lostine weir has changed spawning distribution, timing or behavior. Changes in spawning distribution will be evaluated as a time series once sufficient data are available. One hundred and thirty one redds were counted in the Lostine River in 2001. The results of both the scheduled and additional surveys are summarized below (*Table 5*).

Table 6. Summary of Lostine River chinook salmon spawning ground surveys, 2001.

	Scheduled Surveys				Additional Surveys Below the Weir			
Date	Total	Aug 24	Aug 31	Sept 7	Total	Sept 14	Sept 19	Sept 28
Redds	118	56	32	30	13	12	0	1
Live Fish	203	55	80	68	48	44	4	0
Carcass Recovery	80	29	23	28	41	24	17	0

Fish interrogated at the weir and passed upstream are given a unique mark. Therefore, mark-recapture methodology can be employed to determine abundance. However, biased mark-recapture estimates of population size often result when the number of fish sampled is low. Because of low salmon numbers in the Lostine River, we therefore calculate population abundance ($\hat{N}_a$) using the Bailey modification (1951) of the Peterson Index:

$$\hat{N}_a = \frac{(M+1)(C+1)}{(R+1)},$$

where M is the number of chinook marked and released above the weir, C is the number of chinook examined during the spawning ground survey, and R is the number of recaptures found during the spawning ground survey. The variance is estimated by:

$$Var(\hat{N}_a) = \frac{M^2(C+1)(C-R)}{(R+1)^2(R+2)}$$

Several assumptions are necessary for valid estimates when using the modified Peterson Index (Serber 1982): 1) there is no recruitment to the spawning population over the duration of the experiment 2) marked salmon are recognized as such during the survey 3) marked and unmarked salmon have the same probability of recovery during the survey and are randomly distributed 4) marked and unmarked salmon have equal mortality rates during the interval between marking and the recovery period.

The mark-recapture method can estimate only the population above the weir. The entire river population is then estimated with an annually determined fish-per-redd figure. Fish per redd

calculations are based on the assumptions of accurate population estimates and the complete redd enumeration during the spawning survey. Fish per redd ($\hat{N}_r$) is determined by:

$$\hat{N}_r = \frac{\hat{N}_a}{r},$$

where *r* is the total number of redds counted in the survey, and $\hat{N}_a$ is the number of salmon estimated from the Peterson Index. Total escapement is estimated by multiplying the fish-per-redd figure by the total number of redds counted during the annual survey. According to the fish per redd figure calculated in 2001 and the number of redds, the total estimated escapement into the Lostine River was 563 plus 87 fish not passed above the weir for a total of 650.

2002 ADULT RETURN PREDICTIONS

As is the case for escapement estimates, the reliability of run size forecasts is dependant on valid assumptions. There are also numerous areas for variability in this methodology. However, based on the particular predictive method used, Lostine run size may exceed 692 fish in 2002. These predictions can be used when planning weir operation and broodstock take ratios for the year.

The methods for Lostine River wild salmon predictions are as follows: the Regional TAC estimate for Snake River wild spring salmon entering the Columbia River is 44,900. The conversion rate used to estimate escapement from the mouth of the Columbia River to Lower Granite Dam is 0.456. Therefore, 44,900 x 0.456 = 20,474 wild spring chinook predicted to return to the Snake River above Lower Granite Dam. Chinook run predictions particular to the Lostine River are detailed below.

A. Lostine run predictions based on redd count population estimate (3.2 fish per redd). The median proportion of Lostine fish that have made up the Snake River Run for the past 16 years (0.02518) times the number of wild spring chinook predicted to return to the Snake River above Lower Granite (20,474) equals the run projection for the Lostine River. Therefore, 0.02518 x 20,474 = 516 wild chinook predicted to return to the Lostine River.

B. Lostine run predictions based on redd count population estimate (3.2 fish per redd). The mean proportion of Lostine fish that have made up the Snake River Run for the past 16 years (0.036133) times the number of wild spring chinook predicted to return to the Snake River above Lower Granite (19,558) equals the run projection for the Lostine River. Therefore, 0.036133 x 20,474 = 740 wild chinook predicted to return to the Lostine River.

Hatchery adults from the conventional and captive broodstock programs will also return in 2002 (captive jacks and 4 yr olds and conventional 5 yr. olds). Methods used to predict hatchery returns are based on prior run experience and professional opinion and are explained below.

A. Jacks from the captive brood F1s (99 cohort) will return in 2002. Using the Lostine River captive smolt-to-jack conversion rate from the 2001 return (jack returns divided by the number of smolts released) gives an equation and rate of: 25/34,989 = 0.000715. Therefore, 0.000715 x 133,833 captive brood smolts = 96 CB jacks.

B. Using the Lostine River conventional smolt-to-jack conversion rate from the 2000 return (jack returns divided by the number of smolts released) gives an equation and rate of: 27/12,000 = 0.000715. Therefore, 0.00225 x 133,833 captive brood smolts = 301 CB jacks.

C. Four year old captive F1s (98 cohort) will also return in 2002. Using the Lostine River conventional jack-to-4 yr. old conversion rate from the 2001 return (4 yr. old returns divided by the number of jack returns) gives an equation and rate of: 75/27= 2.778. Therefore, 2.778 x 25 captive brood jack returns = 69 CB 4 yr olds.

D. The Imnaha data can be used to determine an alternative conversion rate. The most recent 5 year average Imnaha jack-to-4 yr old conversion rate is 2.9495. Therefore, 2.9495 x 25 captive brood jack returns = 74 CB 4 yr olds.

E. Five year old conventionals (97 cohort) will return this year. However, we have no Lostine 5 yr. old hatchery salmon return data to determine a conversion rate. Therefore I used Imnaha and Rapid River data as a surrogate. The 12 year average Rapid River 4-to-5 yr old conversion rate is 0.4833. Therefore, 0.4833 x 75 conventional 4 yr. old returns = 36 conventional 5 yr olds.

F. The 17 year average Imnaha River 4-to-5 yr old conversion rate is 0.340557. Therefore, 0.340557 x 75 conventional 4 yr. old returns = 26 conventional 5 yr olds.

G. The most recent Imnaha data may be the most useful due to changing environmental conditions. The most recent 5 year average Imnaha River 4-to-5 yr old conversion rate is 0.140473. Therefore, 0.140473 x 75 conventional 4 yr. old returns = 11 conventional 5 yr olds.

Based on the particular predictive method used, 516 to 740 wild adults may return to the Lostine River this year and 176 to 411 hatchery fish. Regardless of the conversion rates used, these predictions may be high. The smolt to adult ratio (SAR) in the Lostine River would need to be very high for these predictions to be accurate. But if ocean conditions have improved recently perhaps the Lostine River will see returns of this magnitude in 2002.

Juvenile Monitoring and Release

1999 BROOD YEAR

Monitoring of the Lostine juvenile chinook (99BY) reared at Lookingglass Hatchery occurred during 2001. The Nez Perce Tribe conducted sampling activities in coordination with ODFW. Crews from both agencies worked together during the week of February 20 to sample Lostine smolts just prior to their transfer to the Lostine River Acclimation Facility.

Adipose fin clip quality and coded wire tag (CWT) retention was evaluated on 500 fish. The coded wire tag was encountered on 99.1% of the sample. The fin clip mark was evident on 93.5% of the sample.

Biological data were also collected from the sampled parr. Fork length (mm) and weight (g) measurements were recorded from 300 fish. The length frequency was skewed slightly toward the larger lengths in the distribution with no apparent bimodal growth pattern. The modal length was 121 mm.

Descriptive statistics of length and weight are summarized in *Table 5*. Condition factors are included. Indices of condition were calculated according to the Fulton and Relative methods. Relative condition factors compensate for allometric growth as when a fish experiences smoltification. Therefore, it can be used to advantage when comparing the Lostine 98 cohort through time at several life stages. The Fulton condition factor is presented because of its prevalence in research and literature. It is also indicative of the change associated with smoltification. As expected, the Fulton condition factor was lower as the fish prepared to smolt. At this rearing juncture, the hatchery population was at an estimated 19.8 fish per pound.

Table 7. Summary data for the Lostine River chinook parr sampled at Lookingglass Hatchery on February 9-13, 2001.

Measurement	Sample Size (*n*)	Mean	Range	Std. Dev.
Length (mm)	300	120.7	98 – 163	7.87
Weight (g)	300	23.0	11.1 – 51.0	5.01
Fulton's C.F.(K)	300	1.29	0.96 – 1.60	0.10
Relative C.F. (K_n)	300	1.00	0.90 – 1.06	0.03

LOSTINE RIVER ACCLIMATION FACILITY

A total of 134,174 Lostine F1 captives were transported to the Lostine River Acclimation Facility on February 26. Ninety nine transportation morts were picked, scanned and sent to ODFW Fish Pathology in La Grande. OR. ODFW Fish Pathology crews also sampled 49 smolts (lethal sampling) during the week of March 26. One hundred and forty three additional mortalities occurred during the acclimation period.

Because the smoltification process is not only governed by growth, environmental data is also noted. Photoperiod, water temperatures, and stream discharge are cues that help synchronize

smolting in wild salmonids (Clarke and Hirano 1995). Therefore, these data are collected and correlated with the migration of the Lostine hatchery smolts and compared with the migration of the wild smolts. Water temperatures in the acclimation raceways ranged from 32.4° F to 40.3° F with an overall mean of 36° F. During the acclimation period flows in the raceways were maintained at approximately 450 gpm.

The PIT Tag file submitted to *PTAGIS* was amended to account for the mortalities and fish health sample that occurred during the acclimation period.

Downstream Migration

A volitional release strategy was planned for the acclimated smolts. However, the intake "T" joint broke on March 29 which necessitated a premature forced released. The release of the Lostine smolts was monitored through interrogations at the Lostine smolt trap located 13 kilometers downstream from the release site. The Nez Perce Tribe conducted sampling activities with ODFW at the Lostine smolt trap during emigration. In addition, the *PITAGIS* database was also queried for information from interrogated smolts migrating through the Snake River hydroelectric system.

NPT staff worked with ODFW crews on the Lostine smolt trap during spring emigration. The emergency release began on the evening of March 29. The first hatchery smolt was captured by the Lostine trap on the night of April 1. Diel movement through the Lostine trap generally paralleled that of the wild smolts (*Figure 2*). Hatchery smolt emigration was not synchronous with wild smolt emigration according to date (*Figure 3*).

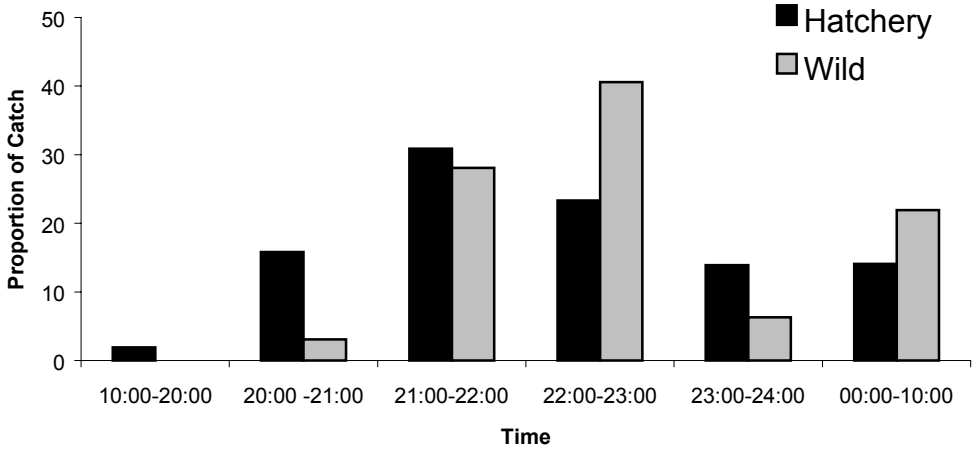

Figure 1 Diel movement pattern of wild and hatchery smolts according to catch at the Lostine River screw trap.

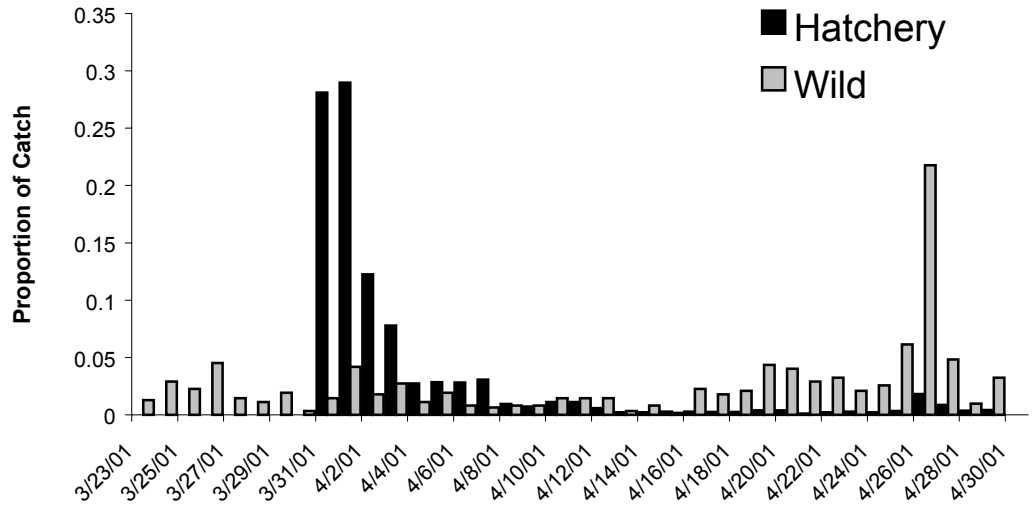

Figure 3. Proportion of wild and hatchery chinook smolt outmigration based on catch at the Lostine River screw trap, 2001.

Preliminary *PITAGIS* data indicates 44% (3526) of the pit tagged captive brood F1s were interrogated at one or more of the three monitored lower Snake River dams or at McNary Dam. Travel time to Lower Granite Dam ranged from 21 to 74 days. The median travel time was 50 days.

2000 BROOD YEAR

Monitoring of the Lostine captive and conventional parr (00BY) reared at Lookingglass Hatchery occurred during 2001. The Nez Perce Tribe conducted sampling and PIT tagging activities in coordination with ODFW. Crews from both agencies worked together during the weeks of October 8th to October 22.

Seven thousand nine hundred and thirty six (7936) fish were PIT tagged (6% of total production). Non-"bleeders" accounted for 97.99% of the tagged fish. Subsequent observations during the following 2 weeks indicated no mortalities associated with the PIT tagging operation in either group. PIT tag retention proved to be high. Three tags were recovered from the raceway after tagging (0.018%).

Biological data were also collected from the pit tagged parr. Fork length (mm) and weight (g) measurements were recorded along with an assessment of fin clip quality (AD). Fin clips were encountered on virtually 100% of the fish sampled. The length frequency was distributed normally with no apparent bimodal growth pattern. Descriptive statistics of length and weight are summarized in *Table 8.* At that rearing juncture, the conventional parr were at an estimated 20.2 fish per pound and the captives at 22.3 fish per pound.

Table 8. Summary data for the Lostine River conventional parr sampled at Lookingglass Hatchery October, 2001.

Measurement	Sample Size (*n*)	Mean	Range	Std. Dev.
Length (mm)	7987	117.9	79 – 184	8.48
Weight (g)	97	22.5	14.4 – 61.6	5.92
Fulton's C.F.(K)	97	1.35	1.08 – 1.75	0.14
Relative C.F. (K_n)	97	1.00	0.93 – 1.07	0.03

Table 9. Summary data for the Lostine River captive parr sampled at Lookingglass Hatchery October, 2001.

Measurement	Sample Size (*n*)	Mean	Range	Std. Dev.
Length (mm)	7993	114.0	73 – 188	8.03
Weight (g)	143	20.4	9.8 – 36.5	5.08
Fulton's C.F.(K)	143	1.39	0.80 – 2.82	0.22
Relative C.F. (K_n)	143	1.00	0.81 – 1.25	0.05

The entire conventional cohort (31,524) was given a Visual Implant Elastomer (VIE) tag to distinguish this hatchery group from the captive group when they return as adults. Tagging occurred at Lookingglass Hatchery from November 13 – 20th. The red tags were implanted in the adipose tissue post orbital of the right eye. The fish were given a 2 day prophylactic Formalin treatment following VIE tagging. Eleven mortalities were attributed to the tagging activity. Tag retention studies occurred during pre-release sampling in 2002.

Juvenile Health Monitoring and Disease

1999 BROOD YEAR

La Grande fish pathology monitored the progeny of Lostine River captive broodstock spawned in 1999 for fish health in 2001. These were monitored at Lookingglass Hatchery in January and February 2001 and at each respective acclimation site prior to release.

The main health problem continued to be bacterial kidney disease, which was manifested by increased loss in raceways containing progeny primarily from moderate/clinical BKD females (Table 9). Two of six Lostine River (Raceways 6 and 7) raceways were affected (ongoing increased loss). There was continued increased loss due to BKD following transfer to acclimation for these groups, as well. Pretransfer and preliberation Rs ELISA values from 100 grab-sampled Lostine River fish showed that 2% (2/100) were low to moderate values (0.200-0.599) and both came from higher risk BKD segregation raceways. Preliminary outmigration data (Erick Van Dyke, ODFW Research) showed first time dam detection differences between the higher risk BKD segregation raceway that experienced increased loss and detections from other raceways (Table 10). The PIT-tag detection rate for the raceway in which a BKD outbreak occurred (Lostine River Raceway 7) was 27%. Mean PIT-tag detections for the all the other raceways were 48.7%. These data show the potential risk of BKD loss associated with rearing progeny from females with elevated Rs ELISA values and support what is known regarding Rs and vertical transmission of this bacteria. These data also show the importance of true segregation rearing of progeny from females with higher ELISA values since there is uncertainty regarding which of these higher ELISA groups may break with BKD. This is important, since vertical transmission of Rs is a risk to offspring and mixed rearing of segregation groups increases the chance for subsequent horizontal transmission of Rs, should an outbreak occur.

2000 BROOD YEAR

Brood year 2000 fish were monitored at Irrigon Hatchery prior to transfer to Lookingglass Hatchery where monitoring continued from April-December 2001. Two scheduled erythromycin (Aquamycin) 28-day medicated feedings were given at Lookingglass Hatchery in May and August.

There were no fish health problems detected during the pretransfer examination at Irrigon Hatchery on 12 March 2001. Clinical BKD was found at Lookingglass Fish Hatchery in one Lostine River raceway (Raceway 3; progeny of high-moderate BKD females) during the May monthly examination. Chronic BKD mortality continued throughout 2001 in this raceway and by the end of 2001 the cumulative loss was 2.0% (Table 11). Three BKD mortalities were also found in raceways 1 and 2 (progeny of low and low-moderate BKD females) in 2001. In June there was an increase in the number of mortalities with external fungus. This was attributed to several factors, including warm temperature and high turbidity near the time of medicated feeding and underfeeding of the medicated feed. Medicated feed was underfed due to an underestimate of the number of fish in the raceways. Hydrogen peroxide treatments were given to help control the fungus since formalin use was restricted in 2001 due to a review process for effluent dilution requirements by the Oregon Department of Environmental Quality (DEQ). Formalin treatments were administered later in the summer following DEQ approval. By

September the fungus problems had subsided and for the remainder of the year there were no fish health problems. All samples tested for virus or replicating agents were negative.

2000 BROOD YEAR CONVENTIONAL JUVENILES

These were all progeny of low/low-moderate females (≤ 0.221 ELISA OD units). There were no health problems detected at Irrigon Hatchery during a pretransfer examination on 12 March 2001. Fish health monitoring continued at Lookingglass Hatchery to the end of 2001. These fish received two 28-day Aquamycin medicated feedings (May and August). There were no BKD problems with these fish. All 27 dead/moribund fish examined during monthly monitoring had ELISA values ≤ 0.158 OD units. External fungus was also found on mortalities in this group of fish and treatments with hydrogen peroxide (and formalin later in the summer following DEQ approval) were initiated. No other significant fish health problems were detected.

Table 10. BKD summary of Lostine River captive brood BY99 F1's at Lookingglass Fish Hatchery (LFH) in 2001.

Stock	Raceway	BKD Segregation	Proportion (%) of Clinical BKD in mortality (July-transfer from LGH) ELISA OD ≥ 1.000	Mortality of F1 progeny since tagging/final ponding to transfer from LGH 2001	
				Total Loss	% Loss
200F99	R2	Low	0/29 (0)	176	0.5
200F99	R4	Low	1/25 (4.0)	134	0.4
200F99	R3	Mod/Clinical	18/31 (58.1)	151	0.8
200F99	R5	Low/Mod/Clinical	16/34 (47.1)	132	0.9
200F99	R6	Mod/Clinical	29/30 (96.7)	2381	12.7
200F99	R7	Mod/Clinical	37/37 (100.0)	2403	13.6

Table 11. Number of tagged Lostine River BY99 F1's released and percent detected at least once at Snake and/or Columbia River dams.

Raceway	ELISA categories	Number of tagged fish released	Percent detected
2	Low	3,501	45%
4	Low	3,494	48%
5	Low/Mod/Clinical	476	53%
7	Mod/Clinical	436	27%

Table 12. BKD summary of Lostine River captive brood BY00 F1's and endemic progeny at Lookingglass Fish Hatchery (LFH) in 2001.

Stock	Raceway	BKD Segregation	Proportion (%) of Clinical BKD in mortality (July-December 2001) ELISA OD ≥ 1.000	Mortality of progeny since tagging/final ponding to December 2001	
				Total Loss	% Loss
200F00	R1	Low	2/23 (8.7)	148	0.4
200F00	R2	Low-Mod	1/17 (5.9)	72	0.3
200F00	R3	Hi-Mod	23/27 (85.2)	374	2.0
200W00	R9	Low/low-mod	0/27 (0)	43	0.1

Operation and Research Coordination

The Nez Perce Tribe participated in the planning process with the Oregon Department of Fish and Wildlife and the Confederated Tribes of the Umatilla Indian Reservation in the development of the Grande Ronde Basin Endemic Spring Chinook Salmon Supplementation Program. As a salmon manager, the Tribe is interested in continuing its coordination with ODFW and CTUIR for the successful operation, monitoring and evaluation of this project. To that end, the Nez Perce Tribe participates in the Technical Oversight Team (TOT) with members from ODFW, CTUIR, and NMFS and the Annual Operating Plan (AOP) development meetings. We continue to participate in management meetings regarding this program.

Furthermore, the Nez Perce Tribe believes that close coordination in the monitoring and evaluation of this project should lead us to a greater understanding of supplementation and its effectiveness in endangered species recovery. Therefore, cooperative efforts with ODFW CTUIR, and NMFS are required to establish synergistic relationships between this and the BPA funded projects listed below.

Artificial Production projects funded under the Columbia River Basin Fish and Wildlife Program that are or will be associated with this project are: 199801006 – Captive Broodstock Artificial Propagation (NPT), 199703800 - Listed Stock Gamete Preservation (NPT), 198805301 - NEOH Master Plan (NPT), 198805305 –NEOH Master Plan and Facilities (ODFW), and 199604400 - Grand Ronde Basin Spring Chinook Captive Broodstock Program. Monitoring and evaluation of hatchery products will occur through this M&E project.

Monitoring and Evaluation projects funded under the Columbia River Basin Fish and Wildlife Program that will complement the Lostine project are: 198712700 - Smolt Monitoring by Non-Federal Entities, 199801006 – Captive broodstock Artificial Propagation and 199202604 – Spring Chinook Salmon Early Life History (ODFW).

Problems Encountered and Anticipated Changes

PROBLEMS ENCOUNTERED

Both operational and research related problems occurred in 2001 during the course of administering the Lostine supplementation program. The more pervasive problems are detailed below.

Acclimation Facility

The volitional release of the captive F1 smolts (99 BY) was scheduled to begin on April 1. On March 29 the water intake "T" valve burst. Emergency oxygen systems were activated and all raceways were maintained with adequate oxygen. It was not possible to immediately repair or replace the valve. Therefore it was decided to prematurely release the fish. During the evening of March 29 all fish were forced from the facility. No fish were lost. However, a volitional release did not occur in 2001.

Release Monitoring

The project is charged with monitoring the departure of the acclimated smolts from the Lostine River Acclimation Facility. A PIT tag detection system was purchased and installed at the site for

the 2001season. The FS1001 transceiver recommended for the site is a high performance unit specifically designed for permanent installations such as at acclimation facilities and dams. Software designed with time-stamp capabilities makes this system particularly appealing for volitional release applications. Action codes for each raceway combined with fish movement data according to day and hour will allow for proper analysis of rearing and acclimation strategies. Calculating the number of fish remaining after the volitional period will be possible without the handling stress of a mark and recapture estimate. Because of the time-stamp feature, accurate migration timing through the hydrosystem is also possible for each fish from a volitional release. Negative travel times would no longer be recorded. However, the laptop computer that coordinated system functions was inadvertently destroyed during the acclimation period.

Low Flow

Low flows in the Lostine River likely create passage problems for migrating salmon during the months of August and September (R2 Resource Consultants 1998). A large volume of water is diverted each summer for irrigation purposes via 14 irrigation ditches. Flows recorded by the USGS gauge located at Baker Rd. were below 15 cfs during August 2001. Salmon migration in the Lostine River is inhibited at flows below 40 cfs (R2 Resource Consultants 1998). If salmon marked and passed at the weir can not negotiate the dewatered reaches above the weir then the assumptions of mark and recapture are violated on the spawning grounds during carcass recovery. Therefore, low flow conditions not only adversely impact fish passage, but as a result, also effect population estimates. Any factor causing under representation of marked fish during carcass recovery would lead to an overestimation of population size.

Juvenile Size

The 2000 conventional cohort were statistically larger ($p < 0.05$) than the 2000 captive cohort at the October sample. This difference, if maintained, could potentially confound evaluations when these two groups are released and their performance compared.

Project Staffing

Although the scope of this project has not changed, the magnitude of the tasks has grown significantly. Monitoring and evaluating in-hatchery production, post release hatchery performance, hatchery adult returns, natural juvenile and adult production, ISRP demands and NEOH activities have increased while staffing has decreased. Additional M&E staff are required to meet the demands of this project.

ANTICIPATED PROGRAM CHANGES

No major changes are anticipated for 2002.

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APPENDIX A

Table 1. Spring chinook data collected from the weir and trap on the Lostine River, 2001[1]. Four hundred forty four salmon were sampled.

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)[2]	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
001	1-Jun	None	F	754	P			3LOP	LR01-01	Clean
002	5-Jun	None	M	N/A	P			NA	NA	Escaped from recovery pen
003	7-Jun	None	F	775	P			3LOP	LR01-03	Clean
004	8-Jun	None	F	760	P			3LOP	LR01-04	Clean
005	9-Jun	None	M	725	P			3LOP	LR01-05	Clean
006	9-Jun	AD	F	767	P			3LOP	LR01-06	Clean
007	9-Jun	None	F	734	P			3LOP	LR01-07	Clean
008	9-Jun	None	M	730	P			3LOP	LR01-08	Clean
009	9-Jun	None	M	698	P			3LOP	LR01-09	Clean
010	9-Jun	None	M	975	P			3LOP	LR01-10	Clean
011	9-Jun	None	F	750	K		LR-0001	3ROP	LR01-11	Clean
012	9-Jun	None	M	825	K		LR-0002	3ROP	LR01-12	Clean
013	9-Jun	None	F	705	P			3LOP	LR01-13	Clean
014	9-Jun	None	F	770	P			3LOP	LR01-14	Clean
015	9-Jun	None	F	745	P			3LOP	LR01-15	Clean
016	10-Jun	None	F	720	K		LR-0003	3ROP	LR01-16	Clean
017	11-Jun	None	M	805	P			3LOP	LR01-17	Clean
018	11-Jun	None	M	785	P			3LOP	LR01-18	Clean
019	11-Jun	None	F	777	P			3LOP	LR01-19	Clean
020	11-Jun	None	M	740	P			3LOP	LR01-20	Clean
021	11-Jun	None	J	510	P			3LOP	LR01-21	Clean
022	11-Jun	None	M	690	P			3LOP	LR01-22	Clean
023	11-Jun	AD	J	462	P			3LOP	LR01-23	Clean
024	11-Jun	None	M	725	K	43/.21	LR-0004	3ROP	LR01-24	Clean
025	12-Jun	None	M	738	P			3LOP	LR01-25	Clean
026	12-Jun	None	M	680	P			3LOP	LR01-26	Clean
027	12-Jun	None	F	668	P			3LOP	LR01-27	Clean
028	12-Jun	AD	F	688	P			3LOP	LR01-28	Old injury on right side below dorsal
029	12-Jun	AD	J	493	P			3LOP	LR01-29	Clean
030	14-Jun	None	F	695	P			3LOP	LR01-30	Clean
031	14-Jun	None	M	785	P			3LOP	LR01-31	Clean
032	14-Jun	AD	J	520	P			3LOP	LR01-32	Clean
033	14-Jun	None	F	780	K		LR-0005	3LOP	LR01-33	Clean
034	14-Jun	None	F	760	P			3LOP	LR01-34	Clean

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
035	14-Jun	None	F	710	P			3LOP	LR01-35	Clean
036	14-Jun	None	M	690	K		LR-0006	3LOP	LR01-36	Injury to lower dentary mandible
037	14-Jun	None	M	680	P			3LOP	LR01-37	Clean
038	15-Jun	None	M	830	P			3LOP	LR01-38	Clean
039	15-Jun	None	M	654	P			3LOP	LR01-39	Clean
040	15-Jun	None	F	790	P			3LOP	LR01-40	Clean
041	15-Jun	None	M	722	P			3LOP	LR01-41	Clean
042	15-Jun	None	F	755	P			3LOP	LR01-42	Clean
043	15-Jun	None	M	750	K		LR-0007	3LOP	LR01-43	Clean
044	15-Jun	None	M	827	P			3LOP	LR01-44	Clean
045	15-Jun	None	F	775	K		LR-0008	3LOP	LR01-45	Clean
046	15-Jun	None	F	768	P			3LOP	LR01046	Clean
047	15-Jun	None	M	700	P			3LOP	LR01-47	Clean
048	15-Jun	None	F	730				3LOP	Empty Vial	No genetic sample
049	16-Jun	None	F	810	P			3LOP	LR01-49	Clean
050	16-Jun	None	M	830	P			3LOP	LR01-50	Clean
051	16-Jun	None	F	782	P			3LOP	LR01-51	Right maxilla injury
052	16-Jun	None	M	750	P			3LOP	LR01-52	Clean
053	16-Jun	None	M	682	K	.3/.1	LR-0009	3ROP	LR01-53	Clean
054	16-Jun	None	M	833	P			3LOP	LR01-54	Clean
055	16-Jun	None	M	786	P			3LOP	LR01-55	Clean
056	16-Jun	None	F	782	K		LR-0010	3ROP	LR01-56	Clean
057	16-Jun	None	M	810	P			3LOP	LR01-57	Clean
058	16-Jun	None	M	835	P			3LOP	LR01-58	Clean
059	16-Jun	None	M	795	K	.56/.25	LR-0011	3ROP	LR01-59	Clean
060	16-Jun	None	M	744	P			3LOP	LR01-60	Clean
061	16-Jun	None	M	738	P			3LOP	LR01-61	Clean
062	16-Jun	AD	M	744	P			3LOP	LR01-62	Clean
063	16-Jun	None	F	785	P			3LOP	LR01-63	Clean
064	16-Jun	None	M	714	P			3LOP	LR01-64	Clean
065	16-Jun	None	F	742	P			3LOP	LR01-65	Clean
066	16-Jun	None	M	690	K	.37/.18	LR-0012	3ROP	LR01-66	Clean
067	16-Jun	None	M	750	P			3LOP	LR01-67	Clean
068	16-Jun	None	F	765	P			3LOP	LR01-68	Clean
069	16-Jun	None	F	755	P			3LOP	LR01-69	Clean
070	16-Jun	None	M	765	P			3LOP	LR01-70	Clean

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
071	16-Jun	None	M	680	P			3LOP	LR01-71	Clean
072	16-Jun	AD	J	438	P			3LOP	LR01-072	Clean
073	16-Jun	None	F	755	P			3LOP	LR01-73	Clean
074	17-Jun	None	M	735	P			2LOP	LR01-74	Clean
075	17-Jun	AD	M	768	K	.54/.27	LR-0013	3ROP	LR01-75	Clean
076	17-Jun	None	M	745	P			2LOP	LR-01-76	Clean
077	17-Jun	None	M	815	P			2LOP	LR01-77	Radio Tag
078	17-Jun	None	M	975	P	.54/.27		2LOP	LR01-78	Old bite mark to ventral surface
079	17-Jun	None	M	930	P			2LOP	LR01-79	Clean
080	17-Jun	AD	M	775	K		LR-0014	3ROP	LR01-80	Clean
081	17-Jun	AD	M	795	P			2LOP	LR01-81	Clean
082	17-Jun	None	M	787	K	.54/.27	LR-0015	3ROP	LR01-82	Clean
083	17-Jun	None	F	783	P			2LOP	LR01-83	Clean
084	17-Jun	None	M	770	P			2LOP	LR01-84	Laceration to occiput
085	17-Jun	None	M	800	P			2LOP	LR01-85	Clean
086	18-Jun	None	F	712	P			2LOP	LR01-86	Clean
087	18-Jun	None	M	780	P			2LOP	LR01-87	Clean
088	18-Jun	None	M	822	K	.63/.32	LR-0016	3ROP	LR01-88	Clean
089	18-Jun	None	F	753	P			2LOP	LR01-89	Clean
090	18-Jun	None	F	825	K	.63/.32	LR-0017	3ROP	LR01-90	Clean
091	18-Jun	None	M	810	P			2LOP	LR01-91	Clean
092	18-Jun	AD	J	490	P			2LOP	LR01-92	PIT tag detected
093	19-Jun	None	F	774	P			2LOP	LR01-93	Clean
094	19-Jun	None	M	784	P			2LOP	LR01-94	Clean
095	19-Jun	None	M	698	P			2LOP	LR01-95	Clean
096	19-Jun	None	M	770	P			2LOP	LR01-96	Clean
097	19-Jun	None	F	819	P			2LOP	LR01-97	Clean
098	19-Jun	None	M	829	K	.63/.32	LR-0018	3ROP	LR01-98	Clean
099	19-Jun	None	M	802	P			2LOP	LR01-99	Clean
100	19-Jun	None	F	783	P			2LOP	LR01-100	Clean
101	19-Jun	None	M	725	P			2LOP	LR01-101	Clean
102	19-Jun	AD	M	695	P			2LOP	LR01-102	Clean
103	19-Jun	None	M	728	P			2LOP	LR01-103	Clean
104	19-Jun	AD	J	475	P			2LOP	LR01-104	Clean
105	19-Jun	AD	M	770	P			2LOP	LR01-105	Clean
106	19-Jun	None	M	792	P			2LOP	LR01-106	Clean

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
107	19-Jun	None	F	775	P			2LOP	LR01-107	Clean
108	20-Jun	AD	J	525	P			2LOP	LR01-108	Clean
109	20-Jun	None	M	720	K	.42/.21	LR-0019	3ROP	LR01-109	Clean
110	20-Jun	None	M	720	P			2LOP	LR01-110	Clean
111	20-Jun	None	F	800	K	.58/.29	LR-0020	3ROP	LR01-111	Clean
112	20-Jun	None	M	775	P			2LOP	LR01-112	Clean
113	20-Jun	None	M	720	K	.42/.21	LR-021	3ROP	LR01-113	Clean
114	20-Jun	None	M	775	P			2LOP	LR01-114	Clean
115	20-Jun	None	M	776	P			2LOP	LR01-115	Clean
116	20-Jun	None	F	785	P			2LOP	LR01-116	Clean
117	20-Jun	None	M	740	P			2LOP	LR01-117	Clean
118	21-Jun	None	F	730	P			2LOP	LR01-118	Clean
119	21-Jun	None	F	755	P			2LOP	LR01-119	Clean
120	21-Jun	None	F	790	P			2LOP	LR01-120	Clean
121	21-Jun	None	F	775	K	.52/.26	LR-022	3ROP	LR01-121	Clean
122	21-Jun	None	F	720	P			2LOP	LR01-122	Clean
123	21-Jun	None	F	855	P			2LOP	LR01-123	Clean
124	21-Jun	None	F	750	P			2LOP	LR01-124	Clean
125	21-Jun	None	M	725	P			2LOP	LR01-125	Clean
126	21-Jun	None	F	675	P			2LOP	LR01-126	Clean
127	21-Jun	None	F	775	P			2LOP	LR01-127	Laceration on occiput
128	21-Jun	None	M	790	K	.56/.26	LR-023	3ROP	LR01-129	Clean
129	21-Jun	None	M	730	P			2LOP	LR01-129	Clean
130	21-Jun	None	F	775	K	.52/.26	LR-024	3ROP	LR01-130	Clean
131	21-Jun	None	F	750	P			2LOP	LR01-131	Injury on caudal peduncle
132	21-Jun	None	M	770	P			2LOP	LR01-132	Clean
133	21-Jun	None	F	765	P			2LOP	LR01-133	Clean
134	21-Jun	None	F	725	P			2LOP	LR01-134	Clean
135	21-Jun	None	M	755	P			2LOP	LR01-135	Clean
136	21-Jun	AD	M	795	P			2LOP	LR01-136	Clean
137	22-Jun	None	F	775	K		LR-025	3ROP	LR01-137	Clean
138	22-Jun	None	M	905	P			2LOP	LR01-138	Clean
139	22-Jun	None	M	700	K		LR-026	3ROP	LR01-139	Clean
140	22-Jun	None	M	745	P			2LOP	LR01-140	Clean
141	22-Jun	None	F	740	P			2LOP	LR01-141	Clean
142	22-Jun	None	F	730	P			2LOP	LR01-142	Clean

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
143	22-Jun	AD	M	695	P			2LOP	LR01-143	Clean
144	22-Jun	None	J	545	P			2LOP	LR01-144	Clean
145	22-Jun	None	F	780	P			2LOP	LR01-145	Clean
146	22-Jun	AD	M	845	P			2LOP	LR01-146	Clean
147	22-Jun	None	F	775	P			2LOP	LR01-147	Fungus on occiput
148	22-Jun	None	F	785	K		LR-027	3ROP	LR01-148	Clean
149	22-Jun	None	F	760	P			2LOP	LR01-149	Clean
150	22-Jun	None	F	775	P			2LOP	LR01-150	Clean
151	22-Jun	None	M	735	P			2LOP	LR01-151	Clean
152	22-Jun	None	M	730	K		LR-028	3ROP	LR01-152	Clean
153	22-Jun	None	M	690	P			2LOP	LR01-153	Clean
154	22-Jun	None	F	720	P			2LOP	LR01-154	Clean
155	22-Jun	None	F	770	P			2LOP	LR01-155	Clean
156	22-Jun	None	M	685	P			2LOP	LR01-156	Clean
157	22-Jun	None	F	760	K		LR-029	3ROP	LR01-157	Clean
158	22-Jun	None	M	705	P			2LOP	LR01-158	Clean
159	22-Jun	None	F	710	P			2LOP	LR01-159	Clean
160	22-Jun	None	M	805	P			2LOP	LR01-160	Clean
161	22-Jun	None	J	520	P			2LOP	LR01-161	Clean
162	22-Jun	None	F	895	P			2LOP	LR01-162	Clean
163	22-Jun	None	M	830	K		LR-030	3ROP	LR01-163	Clean
164	22-Jun	AD	J	470	P			2LOP	LR01-164	Clean
165	22-Jun	None	F	815	P			2LOP	LR01-165	Injury to ventral surface
166	22-Jun	AD	M	715	P			2LOP	LR01-166	Clean
167	22-Jun	None	F	715	P			2LOP	LR01-167	Clean
168	22-Jun	None	M	780	P			2LOP	LR01-168	Clean
169	22-Jun	None	M	745	P			2LOP	LR01-169	Clean
170	22-Jun	None	M	705	P			2LOP	LR01-170	Clean
171	23-Jun	None	M	770	P			2LOP	LR01-171	Clean
172	23-Jun	None	F	790	P			2LOPH	LR01-172	Injury to ventral surface
173	23-Jun	None	M	709	P			2LOPH	LR01-173	Clean
174	23-Jun	None	F	891	K		LR-031	3ROP	LR01-174	Apparent gas bubble disease
175	23-Jun	None	M	725	P			2LOPH	LR01-175	Clean
176	23-Jun	None	M	870	K	.76/.38	LR-032	3ROP	LR01-176	Clean
177	23-Jun	None	F	764	P			2LOPH	LR01-177	Clean
178	23-Jun	AD	M	785	P			2LOPH	LR01-178	Clean

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
179	23-Jun	None	F	870	P			2LOPH	LR01-179	Clean
180	23-Jun	AD	M	765	P			2LOPH	LR01-180	Clean
181	23-Jun	None	F	810	P			2LOPH	LR01-181	Clean
182	23-Jun	None	F	752	P			2LOPH	LR01-182	Clean
183	23-Jun	None	J	529	P			2LOPH	LR01-183	Clean
184	23-Jun	None	M	817	P			2LOPH	LR01-184	Clean
185	24-Jun	None	M	730	P			2LOPL	LR01-185	Clean
186	24-Jun	AD	M	784	K	.54/.27	LR-033	3ROP	LR01-186	Clean
187	24-Jun	None	J	474	K		LR-034	3ROP	LR01-187	No injection
188	24-Jun	AD	J	556	P			2LOPL	LR01-188	Apparent gas bubble disease
189	24-Jun	None	F	775	K	.54/.27	LR-035	3ROP	LR01-189	Clean
190	24-Jun	None	F	790	P			2LOPL	LR01-190	Clean
191	24-Jun	None	M	740	P			2LOPL	LR01-191	Clean
192	24-Jun	AD	F	788	P			2LOPL	LR01-192	Clean
193	24-Jun	None	M	790	P			2LOPL	LR01-193	Clean
194	24-Jun	None	F	774	P			2LOPL	LR01-194	Clean
195	24-Jun	None	M	720	P			2LOPL	LR01-195	Clean
196	24-Jun	None	M	710	P			2LOPL	LR01-196	Clean
197	24-Jun	None	M	775	K	.54/.27	LR-036	3ROP	LR01-197	Clean
198	24-Jun	AD	F	790	K	.56/.28	LR-037	3ROP	LR01-198	Clean
199	24-Jun	None	F	783	P			2LOPL	LR01-199	Clean
200	26-Jun	None	M	896	P			2LOPL	LR01-200	Clean
201	26-Jun	None	M	809	P			2LOPL	LR01-201	Clean
202	26-Jun	None	M	885	P			2LOPL	LR01-202	Clean
203	26-Jun	AD	M	770	P			2LOPL	LR01-203	Clean
204	26-Jun	None	M	740	P			2LOP	LR01-204	Old injury to occiput
205	27-Jun	None	F	785	P			2LOPL	LR01-205	Clean
206	27-Jun	None	F	760	P			2LOPL	LR01-206	Clean
207	27-Jun	None	M	790	K	.56/.28	LR-038	3ROP	LR01-207	Clean
208	27-Jun	None	F	750	P			2LOPL	LR01-208	Clean
209	27-Jun	None	M	755	P			2LOPL	LR01-209	Clean
210	27-Jun	AD	M	780	P			2LOPL	LR01-210	Clean
211	27-Jun	None	M	740	P			2LOPL	LR01-210	Clean
212	27-Jun	None	M	835	K		LR-038	3ROP	LR01-212	Clean
213	27-Jun	None	M	730	P			2LOPL	LR01-213	Clean
214	27-Jun	AD	F	755	P			2LOPL	LR01-214	Clean

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
215	27-Jun	None	F	815	P			2LOPL	LR01-215	Clean
216	27-Jun	None	M	705	P			2LOPL	LR01-216	Clean
217	27-Jun	None	M	690	P			2LOPL	LR01-217	Clean
218	27-Jun	None	F	815	P			2LOPL	LR01-218	Clean
219	27-Jun	None	M	780	P			2LOPL	LR01-219	Clean
220	27-Jun	None	F	780	P			2LOPL	LR01-220	Clean
221	27-Jun	AD	M	805	P			2LOPL	LR01-221	Clean
222	27-Jun	None	M	915	P			3LOPL	LR01-222	Clean
223	27-Jun	None	M	775	P			2LOPL	LR01-223	Clean
224	27-Jun	AD	F	730	P			2LOPL	LR01-224	Clean
225	28-Jun	None	F	825	P			2LOPL	LR01-225	Injury to right maxilla
226	28-Jun	None	F	767	P			2LOPL	LR01-226	Injury to right maxilla
227	28-Jun	None	M	730	K	.44/.22	LR-040	3ROP	LR01-227	Clean
228	28-Jun	AD	F	796	K	.58/.29	LR-041	3ROP	LR01-228	Clean
229	28-Jun	None	M	708	K	.4-0/.20	LR-042	3ROP	LR01-229	Clean
230	28-Jun	None	F	726	K	.44/.22	LR-043	3ROP	LR01-230	Clean
231	28-Jun	None	M	842	K	.68/.34	LR-044	3ROP	LR01-231	Dorsal fin injury
232	28-Jun	None	M	848	P			3LOPL	LR01-232	Clean
233	28-Jun	AD	J	526	P			2LOPL	LR01-233	Clean
234	28-Jun	None	F	700	P			2LOPL	LR01-234	Clean
235	28-Jun	AD	F	760	P			2LOPL	LR01-235	Clean
236	28-Jun	None	M	737	P			2LOPL	LR01-236	Clean
237	28-Jun	None	F	790	P			2LOPL	LR01-127	Clean
238	29-Jun	None	M	746	P			2LOPL	LR01-238	Clean
239	29-Jun	None	F	920	P	??		2LOPL	LR01-239	Clean
240	29-Jun	None	F	746	K	.48/.24	LR-045	3ROP	LR01-240	Clean
241	29-Jun	None	F	767	P			2LOPL	LR01-241	Clean
242	29-Jun	None	F	847	P			2LOPL	LR01-242	Clean
243	29-Jun	None	M	910	P			2LOPL	LR01-243	Clean
244	29-Jun	None	M	772	K	.52/.26	LR-046	3ROP	LR01-244	Clean
245	30-Jun	None	F	773	K	.52/.26	LR-047	3ROP	LR01-245	Clean
246	30-Jun	None	M	778	P			2LOPL	LR01-246	Clean
247	30-Jun	None	M	783	P			2LOPL	LR01-247	Clean
248	30-Jun	None	F	848	P			2LOPL	LR01-248	Clean
249	30-Jun	None	F	791	P			2LOPL	LR01-249	Clean
250	30-Jun	None	M	770	P			2LOPL	LR01-250	Clean
251	30-Jun	None	M	902	P			2LOPL	LR01-251	Clean

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
252	30-Jun	AD	F	840	P			2LOPL	LR01-252	Clean
253	30-Jun	None	M	747	K	.48/.24	LR-048	3ROP	LR01-253	Clean
254	30-Jun	AD	F	815	P			2LOPL	LR01-254	Clean
255	30-Jun	AD	F	817	P			2LOPL	LR01-255	Clean
256	30-Jun	None	F	791	K		LR-049	3ROP	LR01-256	Clean
257	30-Jun	None	M	917	P			2LOPL	LR01-257	Injury to right operculum
258	30-Jun	None	F	733	P			2LOPL	LR01-258	Clean
259	30-Jun	None	F	747	P			2LOPL	LR01-259	Clean
260	30-Jun	None	F	774	P			2LOPL	LR01-260	Clean
261	30-Jun	AD	J	478	KNS				LR01-261	Clean
262	1-Jul	None	F	775	P			2LOPL	LR01-262	Clean
263	1-Jul	None	M	767	P			2LOPV	LR01-363	Clean
264	1-Jul	AD	M	803	P			2LOPV	LR01-264	Clean
265	1-Jul	None	M	803	K	.58/.29	LR-050	3ROP	LR01-265	Clean
266	1-Jul	None	F	818	K	.63/?	LR-051	3ROP	LR01-266	Clean
267	1-Jul	None	M	792	P			2LOPV	LR01-267	Clean
268	1-Jul	None	F	743	P			2LOPV	LR01-267	Clean
269	1-Jul	AD	F	792	P			2LOPV	LR01-268	Clean
270	1-Jul	AD	F	812	P			2LOPV	LR01-369	Clean
271	1-Jul	AD	F	826	P			2LOPV	LR01-270	Clean
272	2-Jul	None	M	787	P			2LOPV	LR01-272	Clean
273	2-Jul	AD	F	833	P			2LOPV	LR01-273	Clean
274	2-Jul	None	M	746	P			2LOPV	LR01-274	Clean
275	2-Jul	None	M	731	P			2LOPV	LR01-275	Clean
276	2-Jul	None	M	990	P			2LOPV	LR01-276	Clean
277	2-Jul	None	M	822	K	.63/.32	LR-052	3ROP	LR01-277	Clean
	2-Jul	ADRV	F	805	KNS					Rapid River
278	2-Jul	None	M	975	P			2LOPV	LR01-278	Clean
279	2-Jul	None	M	730	P			2LOPV	LR01-279	Clean
280	2-Jul	None	F	780	P			2LOPV	LR01-280	Clean
281	2-Jul	None	M	748	P			2LOPV	LR01-281	Clean
282	2-Jul	None	M	748	P			2LOPV	LR01-282	Gill net marks
283	2-Jul	None	M	893	K	.82/.41	LR-053	3ROP	LR01-283	Clean
284	2-Jul	AD	F	780	K	.54/.27	LR-054	3ROP	LR01-284	Clean
285	2-Jul	None	M	716	P			2LOPV	LR01-285	Clean
286	2-Jul	None	M	695	P			2LOPV	LR01-286	Clean

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
287	3-Jul	AD	F	825	P			2LOPV	LR01-287	Clean
288	3-Jul	None	M	812	P			2LOPV	LR01-288	Clean
289	3-Jul	None	M	798	P			2LOPV	LR01-289	Clean
290	4-Jul	None	M	850	K	.71/.35	LR-055	3ROP	LR01-290	Clean
291	4-Jul	None	M	695	P			2LOPV	LR01-291	Clean
292	4-Jul	None	M	760	P			2LOPV	LR01-392	Clean
293	4-Jul	AD	M	770	P			2LOPV	LR01-293	Clean
294	4-Jul	None	M	717	K	.42/.21	LR-056	2LOPV	LR01-295	Clean
295	4-Jul	None	M	727	P			2LOPV	LR01-295	Clean
296	4-Jul	None	M	858	P			2LOPV	LR01-296	Bleeding occiput
297	4-Jul	None	M	765	K-M				LR01-297	Trap mortality
298	5-Jul	None	M	819	P			2LOPV	LR01-298	Clean
299	5-Jul	AD	F	822	P			2LOPV	LR01-299	Clean
300	5-Jul	AD	M	802	P			2LOPV	LR01-300	Clean
301	5-Jul	None	M	783	P			2LOPV	LR01-301	Clean
302	5-Jul	None	F	832	K		LR-057	3ROP	LR01-302	Clean
303	5-Jul	None	M	765	P			2LOP	LR01-303	Clean
304	5-Jul	None	M	775	P			2LOP	LR01-304	Clean
305	5-Jul	None	M	810	P			2LOP	LR01-305	Clean
306	6-Jul	AD	F	780	P			2LOPV	LR01-306	Clean
307	6-Jul	None	F	790	P			2LOPV	LR01-307	Clean
308	6-Jul	None	M	830	K		LR-058	3ROP	LR01-308	Clean
309	8-Jul	None	M	877	P			2LOPH	LR01-309	Clean
310	8-Jul	None	M	856	P			2LOPH	LR01-310	Clean
311	8-Jul	None	M	732	P			2LOPH	LR01-311	Clean
312	8-Jul	AD	M	763	P			2LOPH	LR01-312	Scar between pelvic fins
313	8-Jul	AD	J	510	KNS				LR01-313	Clean
314	9-Jul	None	F	802	P			2LOP	LR01-314	Clean
315	11-Jul	RV	M	690	KNS					Clean
316	11-Jul	ADRV	F	805	KNS				MT	Clean
317	13-Jul	None	F	810	K		LR-059	3ROP	LR01-317	Clean
318	13-Jul	None	M	807	K		LR-060			Clean
319	13-Jul	None	M	677	P			2LOP	LR01-319	Clean
320	13-Jul	None	M	743	P			2LOP	LR01-320	Clean
321	15-Jul	AD	J	564	KNS				LR01-321	Clean
322	20-Jul	None	F	718	P			1LOPL	LR01-322	Clean

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
323	20-Jul	AD	F	795	P			1LOPL	LR01-323	Clean
324	21-Jul	None	F	777	P			1LOPL	LR01-324	Clean
325	21-Jul	AD	M	758	P			1LOPL	LR01-325	Clean
326	21-Jul	AD	F	757	P			1LOPL	LR01-326	Clean
327	22-Jul	AD	M	747	P			1ROPH	LR01-327	Clean
328	22-Jul	None	M	745	K		LR-061	3ROP	LR01-328	Old injury to peduncle
329	22-Jul	None	M	657	P			1ROPH	LR01-329	Clean
330	22-Jul	Ad	J	555	P			1ROPH	LR01-330	Apparent gas bubble disease
331	22-Jul	None	M	808	P			1ROPH	LR01-331	Clean
332	22-Jul	AD	F	781	P			1ROPH	LR01-332	Clean
333	23-Jul	None	M	678	P			1ROPH	LR01-333	Clean
334	23-Jul	None	M	731	P			1ROPH	LR01-334	Clean
335	23-Jul	None	F	711	K		LR-062	3ROP	LR01-335	Clean
336	23-Jul	None	F	745	P			1ROPH	LR01-336	Clean
337	24-Jul	None	F	816	P			1ROPH	LR01-337	Clean
338	24-Jul	None	M	770	K		LR-063	3ROPH	LR01-338	Clean
339	24-Jul	AD	F	767	P			1ROPH	LR01-339	Clean
340	24-Jul	AD	F	774	P			1ROPH	LR01-340	Clean
341	25-Jul	AD	J	598	P			1ROPH	LR01-341	Clean
342	26-Jul	AD	F	803	P			1ROPH	LR01-342	Clean
343	26-Jul	None	F	810	P			1ROPH	LR01-343	Clean
344	26-Jul	AD	F	812	P			1ROPH	LR01-344	Clean
345	30-0Jul	AD	M	780	P			1ROPH	LR01-345	Clean
346	30-Jul	Ad	J	497	KNS				LR01-346	Clean
347	18-Aug	None	M	836	P			2ROPL	LR01-347	Clean
348	18-Aug	None	M	780	P			2ROPL	LR01-348	Clean
349	18-Aug	None	F	786	K		LR-064	3ROP	LR01-349	Clean
350	30-Aug	None	M	730	P			2ROPH	LR01-350	Clean - ripe
351	31-Aug	None	M	776	K		LR-065	3ROP	LR01-351	Clean
352	31-Aug	AD	M	780	P			2ROPH	LR01-352	Clean - ripe
353	31-Aug	AD	M	738	P			2ROPH	LR01-353	Laceration on left operculum
354	31-Aug	None	F	765	P			2ROPH	LR01-354	Clean
355	31-Aug	None	M	805	P			2ROPH	LR01-355	Clean
356	31-Aug	None	J	583	P			2ROPH	LR01-356	Clean
357	31-Aug	AD	J	493	P			2ROPH	LR01-357	Clean
358	1-Sep	AD	F	752	K		LR-066	3ROP	LR01-358	Clean

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
359	1-Sep	None	M	740	P			2ROPH	LR01-359	Clean
360	1-Sep	AD	F	748	P			2ROPH	LR01-360	Clean - ripe
361	1-Sep	None	M	724	K		LR-067	3ROP	LR01-361	Clean - ripe
362	1-Sep	None	F	750	P			2ROPH	LR01-362	Clean - ripe
363	1-Sep	AD	M	644	P			2ROPH	LR01-363	Clean - ripe
364	1-Sep	AD	J	610	P			2ROPH	LR01-364	Clean
365	1-Sep	AD	F	785	P			2ROPH	LR01-365	Clean - ripe
366	1-Sep	AD	F	770	P			2ROPH	LR01-366	Clean
367	1-Sep	AD	M	810	P			2ROPH	LR01-367	Clean
368	1-Sep	None	M	783	P			2ROPH	LR01-368	Clean - ripe
369	1-Sep	None	M	772	P			2ROPH	MISSED	Clean - ripe
370	2-Sep	None	M	792	K		LR-068	3ROP	LR01-370	Clean - ripe
371	2-Sep	AD	M	800	P			3ROP	LR01-371	Clean - ripe
372	2-Sep	AD	F	750	K		LR-069	3ROP	LR01-372	Clean - ripe
373	2-Sep	None	F	817	P			3ROP	LR01-373	Clean - ripe
374	2-Sep	None	F	810	P			3ROP	LR01-374	Clean - ripe
375	2-Sep	AD	F	796	P			3ROP	LR01-375	Clean - ripe
376	2-Sep	None	M	800	P			3ROP	LR01-376	Clean - ripe
377	2-Sep	AD	F	800	K		LR-070	3ROP	LR01-377	Clean - ripe
378	2-Sep	AD	J	580	P			3ROP	LR01-378	Clean - ripe
379	2-Sep	AD	J	595	KNS				LR01-379	PIT tag detected
380	2-Sep	AD	J	521	P			3ROP	LR01-380	Clean - ripe
381	2-Sep	None	F	833	P			3ROP	LR01-381	Clean
382	2-Sep	None	F	800	P			3ROP	LR01-382	Clean - ripe
383	2-Sep	None	M	776	P			3ROP	LR01-383	Clean - ripe
384	3-Sep	AD	F	832	P			3ROP	LR01-384	Clean - ripe
385	3-Sep	AD	M	817	P			3ROP	LR01-385	Clean - ripe
386	3-Sep	None	F	768	P			3ROP	LR01-386	Clean - ripe
387	3-Sep	None	F	760	K		LR-071	3ROP	LR01-387	Clean - green
388	3-Sep	AD	M	648	K		LR-072	3ROP	LR01-388	Clean - ripe
389	3-Sep	None	J	530	P			3ROP	LR01-389	Clean - ripe
390	3-Sep	None	F	815	P			3ROP	LR01-390	Clean
391	3-Sep	Ad	F	761	P			3ROP	LR01-391	Clean
392	3-Sep	Ad	J	540	P			3ROP	LR01-392	Clean
393	3-Sep	None	F	776	P			3ROP	LR01-393	Clean
394	3-Sep	None	M	748	P			3ROP	LR01-394	Clean - ripe

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
395	3-Sep	AD	F	935	P			3ROP	LR01-395	Clean - ripe
396	3-Sep	AD	M	775	P			3ROP	LR01-396	Fungus on caudal
397	4-Sep	AD	M	718	P			3ROP	LR01-397	Clean - ripe
398	4-Sep	AD	F	813	K		LR-073	3ROP	LR01-398	Clean - ripe
399	4-Sep	AD	F	745	P			3ROP	LR01-399	Clean - ripe
400	4-Sep	None	M	778	P			3ROP	LR01-400	Clean - ripe
401	4-Sep	AD	F	816	P			3ROP	LR01-401	Clean - ripe
402	4-Sep	None	F	754	P			3ROP	LR01-402	Clean - ripe
403	4-Sep	None	F	750	P			3ROP	LR01-403	Clean - ripe
404	4-Sep	None	F	760	K		LR-074	3ROP	LR01-404	Clean - ripe
405	4-Sep	AD	F	810	P			3ROP	LR01-405	Clean - ripe
406	4-Sep	None	F	774	P			3ROP	LR01-406	Clean - ripe
407	4-Sep	AD	M	756	K		LR-075	3ROP	LR01-407	Clean - ripe
408	4-Sep	None	M	778	P			3ROP	LR01-408	Clean - ripe
409	4-Sep	None	M	703	P			3ROP	LR01-409	Clean - ripe
410	5-Sep	None	F	759	P			3ROP	LR01-410	Clean - ripe
411	5-Sep	AD	J	593	P			3ROP	LR01-411	Clean - ripe
412	5-Sep	AD	M	798	P			3ROP	LR01-412	Clean - ripe
413	5-Sep	AD	M	798	P			3ROP	LR01-413	Clean - ripe
414	5-Sep	None	F	695	P			3ROP	LR01-414	Clean - green
415	5-Sep	None	F	806	K		LR-076	3ROP	LR01-415	Clean - ripe
416	5-Sep	None	M	774	K		LR-077	3ROP	LR01-416	Clean - ripe
417	10-Sep	None	M	715	P			3ROP	LR01-417	Clean - ripe
418	10-Sep	None	M	770	P			3ROP	LR01-418	Fungus on all fins
419	10-Sep	None	M	653	P			3ROP	MISSED	Clean - ripe
420	11-Sep	AD	M	815	P			3ROP	LR01-420	Clean - ripe
421	11-Sep	AD	F	770	P			3ROP	LR01-421	Clean - ripe
422	11-Sep	AD	F	774	P			3ROP	LR01-422	Clean - ripe
423	11-Sep	None	M	770	P			3ROP	LR01-423	Clean - ripe
424	11-Sep	None	F	689	P			3ROP	LR01-424	Clean
425	12-Sep	None	F	767	P			3ROP	LR01-425	Clean
426	12-Sep	None	M	834	P			3ROP	LR01-426	Clean
427	12-Sep	None	M	757	P			3ROP	LR01-427	Clean
428	14-Sep	None	F	834	P			3ROP	LR01-428	Spawned out
429	14-Sep	None	M	816	P			3ROP	LR01-429	Fungus - ripe
430	14-Sep	None	M	776	P			3ROP	LR01-430	Fungus - ripe

Fish ID #	Date	Fin Clip /Tag	Sex	Fork Length(mm)	Disposition (P,K,KS, M)	Inject Vol Ery/Oxy	Opercle Tag	Opercle Punch	Genetic sample	Comments
431	14-Sep	None	F	758	K		LR-078	3ROP	LR01-431	Clean - ripe
432	15-Sep	None	J	413	P			3ROP	LR01-432	Fungus - ripe
433	15-Sep	None	M	816	P			3ROP	LR01-433	Fungus - ripe
434	15-Sep	AD	J	600	P			3ROP	LR01-434	Fungus - ripe
435	15-Sep	None	F	750	P			3ROP	LR01-434	Fungus - ripe
436	15-Sep	AD	J	558	P			3ROP	LR01-436	PIT tag detected
437	15-Sep	None	M	845	P			3ROP	LR01-437	Fungus - ripe
438	15-Sep	None	M	806	P			3ROP	LR01-438	Fungus - ripe
439	16-Sep	None	M	750	P			3ROP	LR01-439	Fungus - ripe
440	17-Sep	None	M	700	P			3ROP	LR01-440	Fungus - ripe
441	18-Sep	None	M	770	P			3ROP	LR01-441	Fungus - ripe
442	18-Sep	None	M	870	P			3ROP	LR01-442	Post spawn

[1] *The Nez Perce Tribe operated the Lostine weir and trap from May 9 to October 1.*

[2] *P – fish passed, K – fish transported to Lookingglass Hatchery, KS – fish transported and spawned at LGH, M – mortality*